

WHAT IS CLAIMED IS:

1. A lithography system, comprising:
a polarization modulator configured to change light
which is applied thereto from a first polarization profile
to a second polarization profile different than the first
polarization profile; and

a stress modulator in communication with the
polarization modulator, the stress modulator to apply
stress to the polarization modulator.

2. The system of claim 1, further including a light
source positioned to transmit light to the polarization
modulator.

3. The system of claim 1, wherein the light source
is configured to transmit light having a wavelength
selected from the group consisting of 157 nm, 193 nm, and
248 nm.

4. The system of claim 2, further including one or
more optical components positioned between the light source
and the polarization modulator.

5. The system of claim 1, further including an illuminator.

6. The system of claim 5, wherein the polarization modulator is integrated with the illuminator.

7. The system of claim 5, wherein the polarization modulator is positioned along an optical path between the illuminator and an imaging plane.

8. The system of claim 1, wherein the polarization modulator is positioned at a pupil plane of the lithography system.

9. The system of claim 1, wherein the stress modulator is configured to apply stress to an outer surface of the polarization modulator to obtain a polarization profile at an imaging plane.

10. The system of claim 9, wherein the polarization profile exhibits substantially azimuthal symmetry.

11. The system of claim 1, wherein the lithography system comprises a deep ultraviolet (DUV) system.

12. The system of claim 1, wherein the lithography system comprises an immersion lithography system.

13. The system of claim 1, wherein the stress modulator is configured to apply stress using compression.

14. The system of claim 1, wherein the stress modulator is configured to apply stress using expansion.

15. The system of claim 1, wherein the stress modulator is configured to apply stress by heating at least one of the stress modulator and the polarization modulator.

16. The system of claim 1, wherein the stress modulator is configured to apply stress by cooling at least one of the stress modulator and the polarization modulator.

17. The system of claim 1, further comprising:
another polarization modulator positioned to receive light having a received polarization profile and to transmit light having a different transmitted polarization profile; and

another stress modulator in communication with the another polarization modulator, the another stress modulator to apply stress to the another polarization modulator.

18. A method of modifying the polarization of light, comprising:

applying stress to a polarization modulator;
receiving light of a first polarization state in the polarization modulator;
modifying the polarization of light within the polarization modulator; and
transmitting light of a second polarization state different than the first polarization state from the polarization modulator.

19. The method of claim 18, wherein receiving light of the first polarization state comprises receiving light generated with a light source.

20. The method of claim 18, wherein the transmitting light comprises transmitting light to a surface of a substrate.

21. The method of claim 20, wherein transmitting light to a surface of a substrate comprises transmitting patterning light to a surface of a wafer to be patterned.

22. The method of claim 18, further comprising detecting a parameter related to one or more characteristics of the transmitted light.

23. The method of claim 22, further comprising applying a different stress to the polarization modulator based on the parameter.

24. The method of claim 22, wherein the parameter is related to the second polarization state.

25. The method of claim 22, further comprising forming a pattern on a substrate using the transmitted light, and wherein the parameter is a parameter based on the pattern.

26. A polarization control apparatus, comprising:
a polarization modulator configured to change light which is applied thereto from a first polarization profile

to a second polarization profile different than the first polarization profile;

a stress modulator in communication with the polarization modulator, the stress modulator to apply stress to the polarization modulator;

a controller configured to receive a signal based on a parameter related to one or more characteristics of the transmitted light, the controller in communication with the stress modulator and configured to control the stress.

27. The system of claim 26, further including a light sensor positioned to receive at least a portion of the transmitted light, the light sensor in communication with the controller.

28. The system of claim 27, wherein the signal based on the parameter is a signal from the light sensor.

29. The system of claim 28, wherein the parameter is based on the second different polarization profile.

30. The system of claim 26, further comprising a substrate including a pattern formed using the transmitted light, and wherein the parameter is based on the pattern.